

## B Vitamins Supplement Potentiates Antiparkinsonian Effect of Flunarizine: the Behavioral and Biochemical Evidences From 6-Hydroxydopamine Animal Model

Mohamad Sofiabadi, Ph.D.<sup>1</sup>, Hashem Haghdoust-Yazdi, Ph.D.<sup>2</sup>, Hossein Piri, Ph.D.<sup>3</sup>, Mohamad Esmaceli, Ph.D.<sup>4</sup>

1- Cellular and Molecular Research Center, Qazvin University of Medical Sciences, Qazvin, Iran

2- Associate Professor, Cellular and Molecular Research Center, Qazvin University of Medical Sciences, Qazvin, Iran (Corresponding author; E-mail: author; E-mail: hhaghdoust@qums.ac.ir)

3- Cellular and Molecular Research Center, Qazvin University of Medical Sciences, Qazvin, Iran

4- Cellular and Molecular Research Center, Qazvin University of Medical Sciences, Qazvin, Iran

Received: 1 August, 2018

Accepted: 18 August, 2018

### ARTICLE INFO

#### Article type:

Original Article

#### Keywords:

6-hydroxydopamine

Flunarizine

B vitamins

Striatal dopamine level

Malondialdehyde

### Abstract

**Introduction:** Prominent data indicate that flunarizine (flu), a calcium channel blocker, has neuroprotective effect. However, several authors have reported that the chronic use of flu can produce drug-induced Parkinsonism. Previously, we showed that B vitamins supplement (B com) has antiparkinsonian effect. In the present study, we evaluated the effect of pretreatment with flu and a combination of flu and B com on the 6-hydroxydopamine (6-OHDA) - induced Parkinsonism.

**Methods:** 6-OHDA (4 µl, 4 µg/µl) was injected into right striatum by stereotaxic surgery. Different groups of rats received flu (5 or 10 mg/kg) or B com or a combination of them before the toxin to three weeks after that. The severity of Parkinsonism was assessed by conventional behavioral tests and also biochemical measurement of striatal dopamine level. Furthermore, malondialdehyde (MDA) concentration was measured in the serum and brain suspension.

**Results:** Pretreatments with flu or B com significantly attenuated apomorphine- induced rotations and improved rotarod performance, but they had little effect on the 6- OHDA-induced swinging behavior. The pretreatments also reduced the decreasing effect of 6-OHDA on the striatal dopamine level. These antiparkinsonian effects were potentiated when animals were pretreated with a combination of flu and B com. In addition, B com alone or in combination with flu reduced MDA concentration especially in the brain tissue. On the other hand, flu increased MDA concentration in the serum.

**Conclusion:** Our data show that co-administration of B com with flu potentiate largely the antiparkinsonian effect and may attenuate its adverse effects.

### Introduction

Parkinson's disease (PD) is a progressive neurodegenerative disease affecting 1 to 3% of the population over the age of 50. PD is characterized by the loss of dopaminergic (DA) neurons in the substantia nigra pars compacta (SNc). Due to the controversy of the basic molecular

pathogenesis of PD and the selective death of DA neurons, many studies suggest that mitochondrial oxidant stress is an important step in the events leading to the DA neuronal death (1-4). In spite of prominent advances, all current treatments are symptomatic and unable to halt or retard DA neuronal death. Therefore, current studies are being directed toward the